

ABSTRACT OF THE DISCLOSURE

Embodiments of the invention include a method for retrofitting a power plant that reduces the consumption of fossil fuel using compressed heated air by retrofitting the power plant by adding at least three heat exchangers, a vessel, a pump, and a control system to the power plant, wherein the first heat exchanger receives compressed heated air from a power source and produces heated heat exchange fluid and a second heat exchanger heats a hydrocarbon flow that drives a turbine coupled to a generator in the power plant, wherein the generator produces power and exhaust gases, wherein the method entails pumping a heat exchange fluid through a first heat exchanger; exchanging heat with compressed heated air; splitting heated fluid flow into a second heat exchanger and a vessel; flowing the heated fluid through a second heat exchanger exchanging heat with a hydrocarbon flow; flowing the heated fluid from the vessel to a third heat exchanger; and using the vessel to accommodate fluid thermal expansion.